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Eastern Pacific Expeditions of the New York Zoological Society. XVII.

A Review of the American Fishes of the Family Cirrhitidae.[1]

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(Plate I; Text-figures 1-4).

[This is the *seventeenth* of a series of papers dealing with the collections of the Eastern Pacific Expeditions of the New York Zoological Society made under the direction of Dr. William Beebe. The present paper is concerned with specimens taken on the Templeton Crocker Expedition (1936), the Eastern Pacific *Zaca* (1937-1938) and the *Arcturus* Oceanographic (1925) Expeditions. For data on localities, dates, dredges, etc., of these expeditions, refer to *Zoologica*, Vol. VIII, No. 1, pp. 1-45 (*Arcturus*); *Zoologica*, Vol. XXII, No. 2, pp. 33-46 (Templeton Crocker); and *Zoologica*, Vol. XXIII, No. 14, pp. 278-298 (Eastern Pacific *Zaca*).]

CONTENTS.

INTRODUCTION.

For many years the only representative of the family Cirrhitidae known from the Americas was the west coast *Cirrhitus rivulatus* (Valenciennes). In 1927, however, Mowbray described a species from the Isle of Pines, Cuba, establishing a new genus, *Pseudocirrhites*, for his fish, and marking the first West Indian record for the family. During the 1937-1938 expedition of the Department of Tropical Research of the New York Zoological Society along the west coast of Mexico and Central America, still another form was found; it is described as a new species in this paper. Specimens of all three species have been examined and are reviewed and described herewith.

In the light of the recent discovery of a cirrhitoid fish in West Indian waters, the finding of a closely related form on the west coast of America tends to explain the apparent isolation of the Atlantic fish and provides another link in the chain of evidence that demonstrates the close relationship of the fishes of the Atlantic and Pacific sides of tropical American waters.

[1] Contribution No. 590, Department of Tropical Research, New York Zoological Society.

For an explanation of the position of localities mentioned in this paper, see Text-fig. 4.

I am indebted to Dr. Leonard P. Schultz of the U. S. National Museum and Prof. Albert E. Parr of the Peabody Museum. Yale University, for the loan of specimens, and to Miss Janet B. Wilson, who made the drawings used in this paper.

Family Cirrhitidae.

Key for the differentiation of the American genera.

1a. Scales on the cheek very small, 16 to 20 rows from eye to edge of preopercle (Pacific) ..... *Cirrhitus.*

1b. Scales on the cheek large, 4 to 5 rows from eye to edge of preopercle.

2a. Scales absent on nape and interorbital space; a small patch of scales behind and between the anterior nostrils (Pacific) *Cirrhitichthys.*

2b. Scales present on nape and interorbital space. (Atlantic) *Pseudocirrhites.*

Cirrhitus Lacépède, 1803.

Genotype by monotypy, *Cirrhitus maculatus* Lacépède, Lacépède, 1803, Hist. Nat. des Poiss., 5: 2.

Cirrhitus rivulatus (Valenciennes).

(Plate I, Text-fig. 1).

Proportions in Percentage of the Standard Length, and Counts: Depth 34-36 (2.4-3)[2]; head 38-40 (2.46-2.75); eye 7.7 in fish of 119 to 182 mm., 9.2 in 65 mm. fish, 11-11.4 in 30 to 35 mm. fish (3-5.7); snout 11-14.7 (2.3-3.1); maxillary 13.6-17.6 (2.1-2.8); interorbital space 5-6.5 (5.4-7.66); pectoral length 25.4-28.6 in fish of 119 to 182 mm., 32.2-34 in 31 to 65 mm. fish; pelvic length 20-23; snout to 1st dorsal fin 38-41; snout to 2nd dorsal fin 64-68; snout to anal fin 68-73; snout to pectoral fin 34-38; snout to pelvic fin 45-51; 1st dorsal height 11.7-14.6; 2nd dorsal height 12.2-15.4; anal height 17.4-20.6. Dorsal fin X, 11 or 12; anal fin III, 6 or 7; pectoral fin with 14 rays, the uppermost and the lower 7 (rarely 8) simple; scales: 5½ to 6½ from origin of 1st dorsal fin to lateral line, 46 to 49 in a longitudinal series, 12 to 14 scales from lateral line to origin of anal fin, 7 to 8 predorsal scales; gill-rakers. 5 to 6 on upper limb and 10 to 11 on the lower limb of the first arch.

Body compressed, sturdily and heavily built, the caudal peduncle deep. Anterior profile strongly convex, especially in larger individuals, the eye entering the profile very slightly. Scales present on the body, absent on the head except for the preopercle, which is very finely scaled, and the opercle which has scales on its anterior part similar to those of the body; somewhat smaller scales on the posterior flap of the opercle. Lateral line continuous, the openings of the canals tilted upward.

Interorbital space concave; a low longitudinal crest on the nape; preopercle broadly rounded, its upper portion finely serrate, the serrations most conspicuous in small specimens; opercle with an obtuse flap extending backward over the pectoral base. Branchiostegal rays 6, the innermost one very small; the branchiostegal membranes broadly united but free from the isthmus; mouth low, the lips thick in large specimens; maxillary extending backward to the vertical of the posterior border of the orbit in large fish and to the center of the orbit in small fish. Upper jaw with small, rather widely spaced canines, the posterior tooth and three or four near the symphysis en-

[2] Figures in parentheses are proportions stated in terms of times in the head or standard length.

larged; inside of these teeth is a band of smaller teeth, the band widest anteriorly, becoming narrower laterally and vanishing posteriorly. Lower jaw with similar teeth but with two or three of the outer canine-like teeth near the center of each side of the jaw enlarged. Tongue large, wide and free anteriorly. Gill-rakers short, covered with fine asperities.

Spinous dorsal fin rather low, the spines increasing in size to the 5th and 6th, then decreasing, the ultimate spine longer than the penultimate; soft dorsal fin higher than the spinous; caudal fin truncate or slightly concave; anal fin with the second spine largest and heaviest, the rays long, twice the length of the spines; pectoral fin with its lower rays considerably swollen, especially in large individuals, the 5th and 6th from the bottom longest, posterior edge of the branched rays oblique, the uppermost simple ray shortest of all; pelvic fins originating under the center of the adpressed pectoral fin, the tip of the pelvics reaching to the vent or slightly beyond.

Color: During growth there is considerable change in the coloration of this species, the principal alterations being caused, first, by the breaking up of the simple vertical bands of the young into groups of spots bordered with darker and lighter, the spots often acquiring a different basal color; second, the shift from the pearly-gray ground color of the very young to the browns or greenish-browns of the adults; third, the loss of scarlet on the upper anterior surface markings of the head and the disappearance of the scarlet, black and gray spinous dorsal fin.

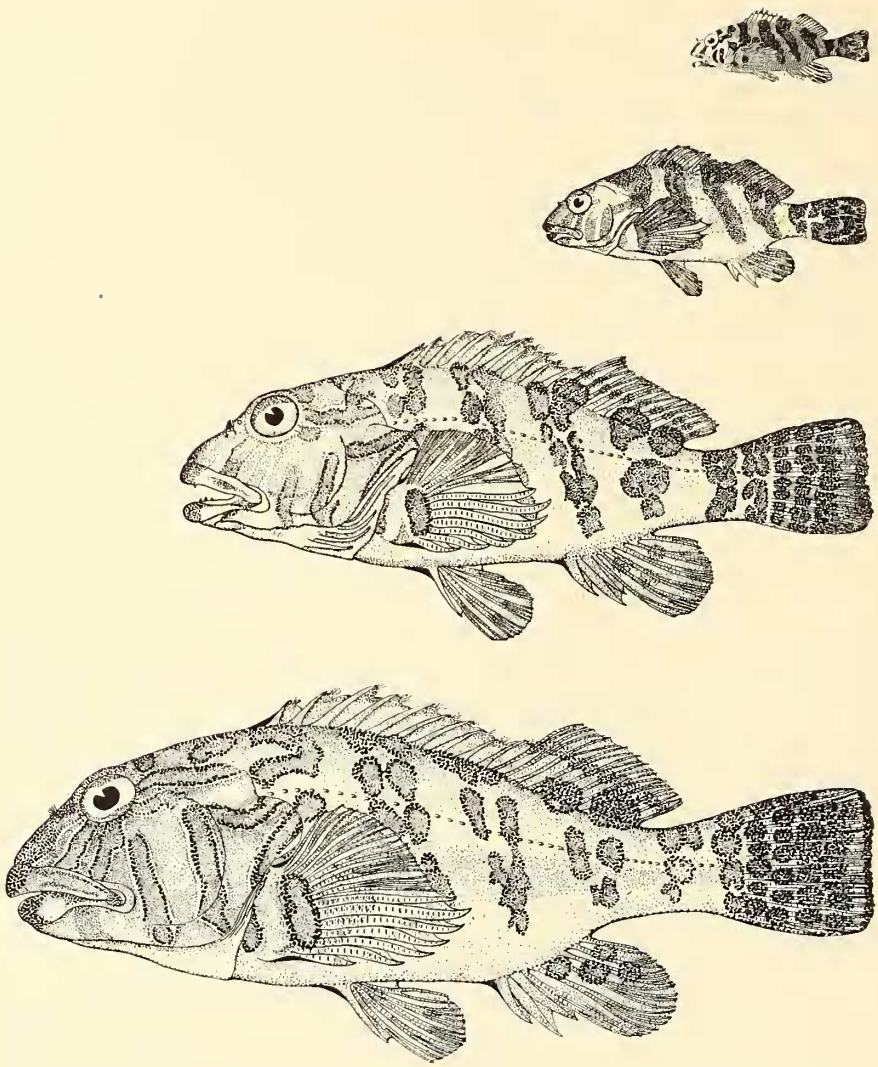
The original description of the young, (nominal *Cirrhitus betaurus*), given by Gill in 1862, agrees excellently with our similar-sized specimens (35 mm.). Gill's description is appended here: "The color is *whitish* on the body, blackish on the shoulders and from the dorsal fin to the eyes, and with four complete, oblique, blackish bands; the first under the middle of the spinous dorsal; the second under the last spine; the third under the middle of the soft dorsal, and the fourth encircling the caudal peduncle. The head has three lateral bands, one on the preorbital region, a second on the cheek, and a third on the posterior margin of the preoperculum. The operculum has a longitudinal oblong spot. The chin has four spots forming the angles of a rhomb, and there is another one behind, on the branchiostegal membrane near the margin. The spinous dorsal is margined with blackish, and the two bands beneath more or less ascend on it; anal blackish. The caudal has a blackish B-shaped mark and a band at its base divided by the lateral line. The pectoral is dusky, with a black spot at its base nearly surrounded by a clear area, and separated from a spot in front of the base. The ventrals are blackish, with nearly transparent sides and margin."

A color plate made in the field from a living 35 mm. specimen shows the following slight differences from this color description: The ground color is pearly gray, the spinous dorsal fin is scarlet with a blackish narrow upper border, the vertical body bands being continued upward onto the fin. All of the dark markings on the head and nape have a central core of reddish-brown. Jordan (Fishes of Sinaloa, *Proc. Cal. Acad. Sciences*, (2) 5: 473) states of similar-sized small individuals: "First dorsal fin bright orange red in life; second reddish; cross bands on body black."

In a 65 mm. standard length fish the ground color is much duller and the bands on the sides are starting to break up into spots. This is especially noticeable on the dorsal surface of the body near the dorsal fin.

In our series the next largest specimen (119 mm.) has the pattern and coloration of all of the remaining larger specimens.

The adults may be described as follows, the description being combined from other descriptions and our own observations. Color of body dark greenish- or yellowish-brown, occasionally more ochraceous brown on the lower head and belly (dark gray: Fowler). Dark brown, spots and bands, occasionally becoming yellowish-brown, usually bordered first with darker brown or



Text-figure 1.

Cirrhitus rivulatus Valenciennes. Specimens of 35, 65, 142 and 182 mm. standard length, showing the changes of pattern with age.

black and then with pale blue, distributed as follows: three narrow bands crossing the interorbital space; two to three bands from the eye to the maxillary or premaxillary; a saddle-like transverse band on the nape posterior to the eye, in the center of which, posteriorly, is a small circular spot; on the nape are three longitudinal short bars, one on the mid-dorsal line and one on either side of this; a band from eye to supra-scapular; one from eye to upper border of the preopercle; a vertical band on the preopercle anteriorly and another on the posterior border; an upwardly ascending band from the upper edge of the preopercle toward the upper tip of the opercle; a short vertical band on the base of the pectoral fin and another similar one

on the pre-pectoral region. Body with five upright oblique bands of similarly colored and bordered broken spots, the bands extending onto the spinous and soft dorsal fins; in addition there is a similar band on the posterior end of the caudal peduncle. Caudal fin with sub-circular brown spots bordered with darker brown and light blue, the spots roughly forming vertical and semicircular vertical lines; this arrangement is not always apparent, in large specimens. In some descriptions the tail is described as being dark with a network of pale blue reticulated lines. Dorsal fin dark brown, somewhat mottled with continuations of the bars of the sides of the body; pectoral fins dusky; anal fin dark brown, sometimes green basally, with two to five prominent spots similar to those on the body on its posterior portion; pelvic fins dusky, especially toward the tip, sometimes olive basally, gray-black terminally.

Iris in life (327 mm. fish) olive green above and below with a broad silvery zone extending longitudinally, within which are two rounded spots in front and two more behind the pupil. A narrow green area immediately surrounding the pupil.

Range: Pacific mainland from Lower California and the Gulf of California southward to Panama (Mexico: Cape San Lucas, Gulf of California, Mazatlan, Sihuatanejo, Acapulco; Nicaragua: Corinto; Costa Rica: Piedra Blanca Bay, Uvita Bay; Panama: Panama); Revillagigedo Islands (Clarion Is., Socorro Is.); Galápagos Islands (Hood Is., James Is., Tower Is.); Malpelo Island.

Local Distribution: A rocky reef and tidepool species, hiding in crevices and darting out for prey.

Method of Capture: Hook and line baited with bait or with a shiny piece of metal, traps, poisoning in tidepools.

Size: Grows to 17½ inches. A 327 mm. (12½ inches) fish weighed 3 pounds and a 450 mm. (17½ inches) fish weighed 5 pounds.

Study Materials: 8 specimens from 31 to 450 millimeters, from the following localities: Nicaragua: Corinto; Costa Rica: Piedra Blanca Bay, Uvita Bay; Galápagos Islands: Tower Island. In addition, water-glass sight records were made of this species at the following places: Mexico: Sihuatanejo, Acapulco; Clarion Island.

References: *Cirrhites rivulatus* Valenciennes, Voyage autour du Monde, sur la fregatte "La Venus," tome **5**, Ichthyologie, 1855: 309, plate 3, fig. 1 (Description, color, poor plate: **type locality, Galápagos Islands**); Günther, Catalogue of the Acanthopterygian Fishes in the Collection of the British Museum, **2**, 1860: 519 (Short description); Jordan, D. S. and Gilbert, C. H., List of Fishes collected at Mazatlan, Mexico, by Charles H. Gilbert, *Proc. U. S. Nat. Mus.*, **2**, 1882 (1883): 108 (Check-list, name only); Jordan, D. S., A list of the fishes known from the Pacific coast of tropical America, from the Tropic of Cancer to Panama, *Proc. U. S. Nat. Mus.*, **8**, 1885 (1886): 381 (Check-list; Cape San Lucas, Galápagos Islands); Jordan, D. S. and Evermann, B. W., The Fishes of North and Middle America, *Bull. U. S. Nat. Mus.*, **47** (2), 1898: 1491 (Description, color, range, short synonymy); Jordan, D. S. and McGregor, R. C., List of fishes collected at the Revillagigedo Archipelago and neighbouring islands, *Rept. U. S. Fish Comm.* for 1898 (1899): 283 (Clarion and Socorro Islands); Jordan, D. S. and Evermann, B. W., The Fishes of North and Middle America. *Bull. U. S. Nat. Mus.*, **47** (4), 1900: plate 227, fig. 576 (figure); Pellegrin, J., Poissons recueillis par M. Leon Diguet dans le Golfe de Californie, *Bull. Mus. Hist. Nat.* (Paris), **7**, 1901: 163 (Gulf of California); Gilbert, C. H. and Starks, E. C., The Fishes of Panama Bay, *Mem. Calif. Acad. Sci.*, **4**, 1904: 139 (Panama; restates Günther's 1868 record); Beebe, W., Galapagos, World's End, G. P. Putnam's Sons, New York and London, 1924: plate 5 (colored figure); Ulrey, A. B., A check-list of the fishes of Southern California and Lower California, *Journ. Pan-Pacific Res. Inst.*, **4** (4), 1929: 18 (Check-list only; Cape San Lucas); Terron, C. C., Lista de los peces de los costas de la Baja California, *Ann. Inst. Biol., Univ. Nac. Auton. Mexico*, **3**, 1932: 79 (Check-list, name only, Cape San

Lucas); Breder, C. M., Jr., Heterosomata to Pediculata from Panama to Lower California, *Bull. Bingham Oceanogr. Coll.*, **2** (3), 1936: 37 (Unknown locality).

Cirrhitus rivulatus: Gill, T., Synopsis of the family of Cirrhitoids, *Proc. Acad. Nat. Sci. Phila.*, 1862: 107 (Name, synonymy, range); Gill, T., Catalogue of the fishes of Lower California, in the Smithsonion Institution, collected by Mr. John Xantus, *Proc. Acad. Nat. Sci. Phila.*, 1862: 259 (Cape San Lucas, Lower California); Snodgrass, R. E. and Heller, E., Shore fishes of the Revillagigedo, Clipperton, Cocos and Galapagos Islands, *Proc. Wash. Acad. Sci.*, **6**, 1905: 385 (Galápagos Islands, range, few proportions); Beebe, W., The Arcturus Adventure, G. P. Putnam's Sons, New York and London, 1926: 150 (Hood Island, Galápagos; method of capture). See p. 434 for specific determination; Jordan, D. S., Evermann, B. W. and Clark, H. W., Check list of the fishes and fishlike vertebrates of North and Middle America north of the northern boundary of Venezuela and Colombia, *Rep. U. S. Comm. of Fish*, for 1928 (1930): 358 (Check list, range); Fowler, H. W., The Fishes of the George Vanderbilt South Pacific Expedition, 1937, *Acad. Nat. Sci. Phila., Monograph* No. **2**, 1938: 15 (Description, color; Malpelo Island), 53, (Note on color, proportions; James Island, Galápagos), 257, (check list).

Cirrhitus betaurus: Gill, T. N., Catalogue of the fishes of Lower California in the Smithsonian Institution, collected by Mr. John Xantus, *Proc. Acad. Nat. Sci. Phila.*, 1862: 259 (Original description, color; **type locality: Cape San Lucas, Lower California**); Jordan, D. S. and Gilbert, C. H., Catalogue of the fishes collected by Mr. John Xantus at Cape San Lucas, which are now in the United States National Museum, with descriptions of eight new species, *Proc. U. S. Nat. Mus.*, **5**, 1882 (1883): 371 (Synonymized with *Cirrhitus rivulatus*).

Cirrhitichthys rivulatus: Günther, A., An account of the Fishes of the States of Central America, based on collections made by Captain J. M. Dow, F. Godman, Esq., and O. Salvin, Esq., *Trans. Zool. Soc. London*, **6** (7), 1868: 387 (Check list); Galápagos Islands, Panama), 421, plate 86, fig. 4 (Panama, description, figure).

Cirrhites betaurus: Jordan, D. S., The fishes of Sinaloa, *Proc. Calif. Acad. Sci.*, (2) **5**, 1895: 472 (Relationship of *betaurus* and *rivulatus* discussed, color, Mazatlan); Jordan, D. S. and Evermann, B. W., The Fishes of North and Middle America, *Bull. U. S. Nat. Mus.*, **47**, 1898: 1492 (Description, color, range); Ulrey, A. B., A check-list of the fishes of Southern California and Lower California, *Journ. Pan-Pacific Res. Inst.*, **4** (4), 1929: 18 (Check list only. Cape San Lucas); Terron, C. C., Lista de los peces de las costas de la Baja California, *Ann. Inst. Biol., Univ. Nac. Auton. Mexico*, **3**, 1932: 79 (Check list, name only; Cape San Lucas).

Cirrhitichthys Bleeker, 1856.

Genotype by original designation *Cirrhites graphidopterus=Cirrhites aprinus* Cuv. and Val.; Bleeker, *Naturk. Tijdschr. Nederl.-Indie*, Deel X (new series, Deel VII) 1856: 474. The generic description was published in 1857 by Bleeker, Vischfauna van Ambonia, *Acta Soc. Sci. Indo-Nederl.*, 2, 1857: 39.

Cirrhitichthys corallicola sp. nov.

(Text-figure 2).

Type: Holotype, No. 28,710a, Eastern Pacific *Zaca* Expedition of the Department of Tropical Research, New York Zoological Society; Gorgona Island, off the Pacific coast of Colombia, South America (Lat. 2° 58′ N., Long. 78° 11′ W.), in coral, March 30, 1938; standard length 58 mm. *Paratypes*: 32 specimens, No. 28,710, same locality and date as the holotype, 22 to 59 mm. standard length. Types in the collections of the Department of Tropical Research, New York Zoological Society.

Measurements in Percentage of the Standard Length, and Counts: Measurements of the holotype: Depth 36.6 (2.7); head 34.5 (2.9); eye 8.4

(4.1 in head); snout 11.2 (3.1 in head); interorbital space 5.7 (6.1 in head); maxillary 13.3 (2.6); pectoral fin length 33.5 pelvic fin length 24; snout to origin of 1st dorsal fin 33.5; snout to 2nd dorsal fin 64; snout to origin of anal fin 68; snout to pectoral fin 32; snout to pelvic fin 45; 1st dorsal height 17.6; 2nd dorsal fin height 26.8; anal fin spine height 21.6.

Measurements of 10 individuals, 34 to 58 mm. standard length, including those of the holotype: Depth 33-39.5 (2.6-2.9); head 34.2-39 (2.5-2.9); eye 7.8-10.9 (4.1-4.5); snout 10.2-12.4 (3.1-3.5); maxillary 12.3-14.2 (2.6-2.9); interorbital space 4.4-6.1 (6.1); pectoral fin length 31-37; pelvic fin length 23.7-26.3; snout to origin 1st dorsal fin 31.5-37; snout to 2nd dorsal fin 62-65; snout to origin of anal fin 65-72; snout to pectoral fin 32-36; snout to pelvic fin 42-49; 1st dorsal height 16-19; 2nd dorsal height 23-29; anal fin height (spine) 20-22. *Counts*: dorsal fin X, 12; anal fin III, 6; pectoral fin with 14 days, the uppermost ray and the lowermost 6 or 7 simple; scales 43-45 in a lateral series, 4 from origin of dorsal fin to lateral line, 9 or 10 from lateral line to origin of anal fin; gill-rakers 3 to 5 on upper limb, 9 to 11 on the lower limb of the first gill-arch, the lowermost two rudimentary; vertebrae 10 plus 15 plus 1.

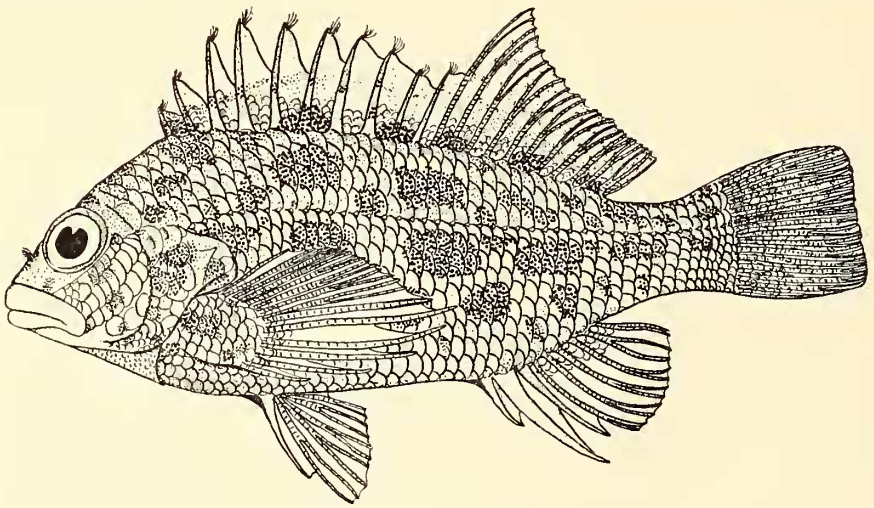
Body compressed, the head obtusely pointed, the greatest depth at ½ the length of the pectoral, depth of caudal peduncle 13.3% of the length. Anterior profile at a 45 degree with the axis of the body, with a slight notch just above the orbit, the latter entering the profile. Upper profile from origin of dorsal fin to the 7th spine straight, the profile then gently curving toward the peduncle. Lower profile from snout to beneath base of pelvic fins at a considerable angle to the line of the abdomen.

Scales cycloid, absent on the head with the exception of the opercles and a small patch between the posterior nostrils; lips naked. Four oblique rows of scales on the preopercle from the eye to the rounded angle of the preopercle. Scales present on the opercles and on the branchiostegal membranes immediately beneath the isthmus; the latter scales are very small. Scales extending on the bases of the spinous dorsal fin and on the membranes of the soft dorsal and anal fins. Lateral line continuous, the tubes short and opening upward; nape with a large number of tubes.

Head obtusely pointed, the eye entering dorsal profile; interorbital space concave, the supraorbital ridges prominent, especially posteriorly; anterior nostril circular, with a short tube, nearer eye than snout and with a 5-fingered fleshy tentacle on its posterior border; posterior nostril with a raised border internally and anteriorly, placed close to the orbit; preopercle broadly rounded with 17 to 18 short but strong serrae, the uppermost slightly longer than the lower; opercle ending in an obtuse flap and with two flat spines, the lower much larger and more evident than the upper; branchiostegal rays 6, the innermost one on each side very small; branchiostegal membranes broadly connected but free from the isthmus; mouth small, the lips fleshy; maxillary extending to below the center of the orbit, the maxillary almost completely hidden beneath the suborbital. Teeth of the upper jaw with an outer row (20 to 21 on each side) of small, recurved canines, two on each side of the isthmus considerably larger and stronger than the others, the posterior teeth of the jaw slightly larger than their fellows; behind this outer row is a villiform band of small teeth, widest anteriorly, becoming narrower as it progresses backward. Lower teeth similar to those of the upper jaw, except that on the middle of the side of each jaw there is a group of enlarged canines; anterior to these the teeth are similar in size to those of the upper jaw, posterior to the enlarged group the teeth are quite small. The internal band of villiform teeth on the lower jaw extends backward only as far as the anterior tooth of the lateral enlarged canines. Vomer and palatines with villiform teeth, the teeth of the vomer in a broadly arched band. Gill-rakers small and short.

Dorsal fin with the 3rd, 4th and 5th spines highest, the upper anterior

edge of each interspinal membrane with a series of 8 to 10 dermal tentacles; soft dorsal high, the anterior two rays elongate and forming a slight lobe. Anal fin high, the second spine longer and heavier than the others, its length 1.5 in the head, length of the 1st spine 1.9 in the second, length of the third spine 1.3 in the second. Caudal fin truncate. Pelvic fins in close juxtaposition, their origin beneath the anterior 2/5ths of the pectoral fin, the tips of the pelvics extending to the vent. Pectoral fin with 14 rays, the uppermost one unbranched, the six lowermost (rarely the 7th) simple and unbranched, slightly swollen and with their tips free from membrane; 5th from bottom ray longest (1.15 in the head in the type), the 4th and 6th next longest.



Text-figure 2.

Cirrhitichthys corallicola Tee-Van. Drawing of the type, 58 mm. standard length.

Color: In life the general body color is orange yellow with a pinkish or lavender cast, heavily covered with dark orange or red spots placed somewhat in alternate oblique upright rows of larger and smaller spots, the spots extending onto the lower portion of the dorsal fin; similarly colored spots on the head, snout and base of the pectorals are much smaller than those on the body. Dorsally and posteriorly the spots become brighter red in color. Snout reddish. Dorsal fin transparent yellow, mottled with brownish, the tips of the spines and the tentacles on the interspinous membranes scarlet; caudal fin yellow mottled with dusky; pectoral, pelvic and anal fins transparent yellow, the latter somewhat dusky. Iris golden red.

In the Gorgona Island specimens the spots are exceptionally well-marked and clean cut. In many of the specimens from more northerly localities, the spots tend to merge and thus produce irregular vertical bands. This condition is especially noticeable in a 30 mm. fish from Acapulco, less so in some others.

In preservative our specimens have become yellow with brownish and gray spots, the pattern of the body being retained. In two specimens from the Pearl Islands, Panama (Vanderbilt Collection) there remain only vague traces of the spots on the body.

Range: Found by us from Sihuatanejo, Mexico, southward along the coast to Gorgona Island, Colombia. (Mexico: Sihuatanejo Bay, Acapulco; Costa Rica: Port Parker, Port Culebra; Panama: Bahia Honda, Pearl

Islands (Vanderbilt *Alva* 1938 Expedition); Colombia: Gorgona Island). The majority of the specimens seen and taken by us were found in the interstices of coral. The fishes were rarely seen from above, but they were exceptionally conspicuous when viewed from a diving helmet while submerged.

Remarks: This species is blenny-like in the rapidity of its movements and general habits and also resembles in this respect, some of the smaller serranids. Our field names of "lavender blenny" or "lavender serranid," given before we had been able to catch an example, are evidence of the appearance of the fish in life.

Specimens Examined: 45, including the types and paratypes, from the localities mentioned above under *Range*.

Pseudocirrhites Mowbray, 1927.

Genotype by monotypy, *Pseudocirrhites pinos* Mowbray, in Breder, *Bull. Bingham Oceanogr. Coll.*, 1 (1), 1927: 48.

This genus is close to the Pacific *Cirrhitichthys*, differing principally in the possession of scales on the nape and interorbital space. In *Cirrhitichthys*, as represented by *C. corallicola* and a Japanese specimen of *C. aureus*, scales are absent on the regions mentioned above, but present in a small subcircular patch between and posterior to the anterior nostrils. I have not checked on other species of *Cirrhitichthys* to determine whether this condition is true of all of the species of the genus.

Considering the geographical isolation of the Atlantic species plus the difference in scalation, *Pseudocirrhites* is maintained as a valid genus, as opposed to synonymizing it with *Cirrhitichthys*, to which it is closely related.

In the original description of *Pseudocirrhites*, Mowbray mentions the following as the principal character of his new genus: "The above new genus is based on the broadly united gill-membranes." This conception of the new genus was probably based on a misstatement in Jordan and Evermann, *Bull. U. S. Nat. Mus.*, 47: 1490, which gained emphasis by being repeated in Jordan and Evermann, The Shore Fishes of the Hawaiian Islands (*Bull. U. S. Fish Comm.*, 23 (1), 1905: 446), and in Jordan and Herre's A Review of the Cirrhitoid Fishes of Japan (*Proc. U. S. Nat. Mus.*, 33, 1907: 157). This error described the gill-membranes in Cirrhitidae as *separate* and free from the isthmus. Unfortunately this is not true, as the possession of *broadly united* gill-membranes is characteristic of all members of the family that have been examined and is so mentioned in other descriptions beyond those listed here. (*See also*: Regan, On the Cirrhitoid Percoids, *Ann. Mag. Nat. Hist.*, (8) 7: 259-262).

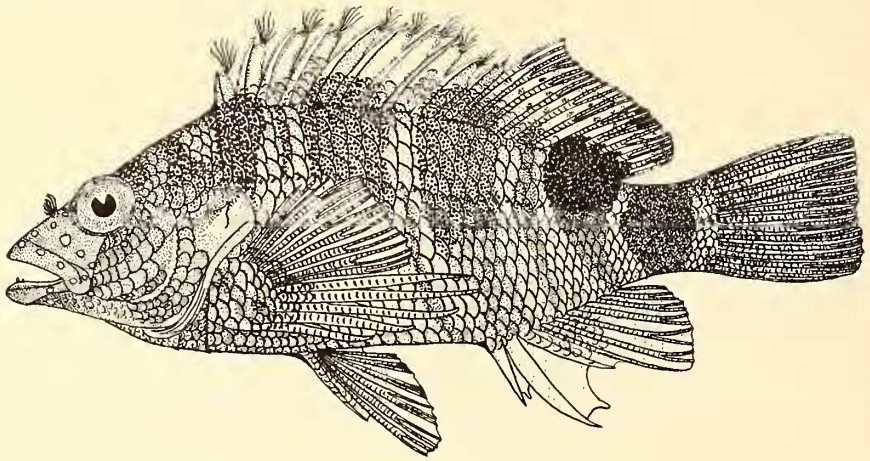
The definition of *Pseudocirrhites* may be rewritten as follows: Cirrhitoid fishes with rather large cycloid scales, approximately 42 rows in a lateral series; 4 to 5 rows of scales on the cheek; nape and interorbital space as far forward as the anterior nostrils fully scaled. Teeth present on the vomer and palatines; jaws with an outer row of small canines inside of which are villiform bands of smaller teeth, a few strong, backwardly-turned canines on center of side of each lower jaw, upper jaw with a few slightly enlarged teeth near the symphysis and toward the posterior end of each jaw. Preopercle serrate. Branchiostegals 6.

Pseudocirrhites pinos Mowbray.

(Text-figure 3).

Proportions in Percentage of the Standard Length, and Counts: Depth 33-38 (2.6-3); head 37 (2.7); eye 9.2-9.6 (3.84-4); snout 11.3-11.7 (3.1-3.3);

maxillary 13-13.4 (2.74-2.86); interorbital space 4.8-5.76 (4.15-6.4); pectoral fin length 36.5-39; pelvic fin length 21.6-25; snout to 1st dorsal fin 36; snout to 2nd dorsal fin 62-64.5; snout to anal fin 70; snout to pectoral fin 34-36; snout to pelvic fin 45-49. 1st dorsal fin height 15.7; 2nd dorsal fin height 18.5-21.5; anal fin height 20.8. *Counts*: dorsal fin X,11; anal fin III, 6; pectoral fin, 14 rays, the top 1, and lower 5 simple; pelvic fin I, 5; scales: 6 from origin of dorsal fin to lateral line, 42 in a lateral series, 8 from the lateral line to the origin of the anal fin; gill-rakers 6 on upper limb of first arch, 8 to 9 on the lower limb of the first arch.



Text-figure 3.

Pseudocirrhites pinos Mowbray. Drawing of the type, 54 mm. standard length.

Body oblong, compressed; depth of the caudal peduncle 2.8 in the head. Body and head covered with large cycloid scales, with the exception of the snout and preorbital, and the maxillary and premaxillary; branchiostegal membranes scaled. Lateral line continuous, nearly straight, extending onto the base of the caudal; pores turned obliquely upward. A series of small dermal tentacles on the anterior upper edge of each interspinal membrane of the dorsal fin.

Eye placed high and slightly entering the dorsal profile; interorbital space concave; anterior nostril with a fringed tentacle; preopercle rounded, finely serrate; opercle with a single flat spine; branchiostegal membranes united (accidentally broken during re-examination of the type) and free from the isthmus, covered with small scales; mouth small, placed low; maxillary narrow, about ¾ entirely covered by the preorbital; premaxillaries little protractile; villiform teeth in bands in each jaw, on the outer border of which are a band of small canines, 3 or 4 slightly enlarged canines near the symphysis of the upper jaw, a few enlarged teeth at the posterior end of the jaw; a few strong canines on the middle of the sides of the lower jaw; vomer and palatines with small teeth. Caudal fin truncate, its rays about equal in length to the second anal spine, the first spine of the anal fin about 2 in the second, the second spine longest and strongest, the third intermediate in length and strength to the other two; pectoral fin with 14 rays, the uppermost 1, and lowermost 5 simple, the remainder branched; lowermost simple rays considerably longer than the other rays; tip of pectoral extending to the 1st soft ray of the anal fin; pelvic fins with their tips extending to the 1st anal spine.

A 26 mm. fish differs from the type in being less deep, and in having the two upper rays of the pectoral fin simple on the right side, and the upper three simple on the left side.

Coloration: Head and body light brown; three vertical light-colored bands on body, broadest inferiorly, in the center of each band is a narrow brown line; a broad band of dark brown covering the entire caudal peduncle; a brown spot larger than the eye, two-thirds of which is on the body, at the base of the posterior dorsal rays. The bands of the body, both dark and light, extend onto the dorsal fin. Pectoral, ventral and caudal fins pale. Head and nape and dorsal fin with bright red spots.

In a color plate made from life of the 26 mm. fish, the narrow brown lines in the center of the light colored bands are faint; the spot at the base of the soft dorsal and the band on the caudal peduncle are black; the pectoral and anal rays and the basal portions of the upper rays of the caudal fin are reddish.

Text-figure 4.

Map of the Eastern Pacific *Zaca* (1937-1938) Expedition of the Department of Tropical Research of the New York Zoological Society, showing the localities mentioned in the text. The Isle of Pines, Cuba, the type locality of *Pseudocirrhites pinos* Mowbray, is the small island immediately south of the western end of Cuba.

Range: Known from the Isle of Pines, Cuba, and from Saba Bank, 6 miles S. W. of Saba Island, West Indies (17° 35′ N., 63° 21′ W.)

Local Distribution: The two known specimens of this species were taken in coral, in shallow water (type) and at 25 fathoms.

Study Materials: The type and a specimen taken by the *Arcturus* Oceanographic Expedition on Saba Bank, West Indies, March 15, 1925 (Dept. Trop. Res., N. Y. Zoological Society, No. 5061, color plate A.822.)

References: *Pseudocirrhites pinos.* Mowbray, in Breder, *Bull. Bingham Oceanogr. Coll.* **1** (1), 1927; 48, fig. 23 (Description, color; figure; **type locality, Isle of Pines, Cuba**; Type: No. 382, Bingham Oceanogr. Coll., Peabody Museum, Yale University).

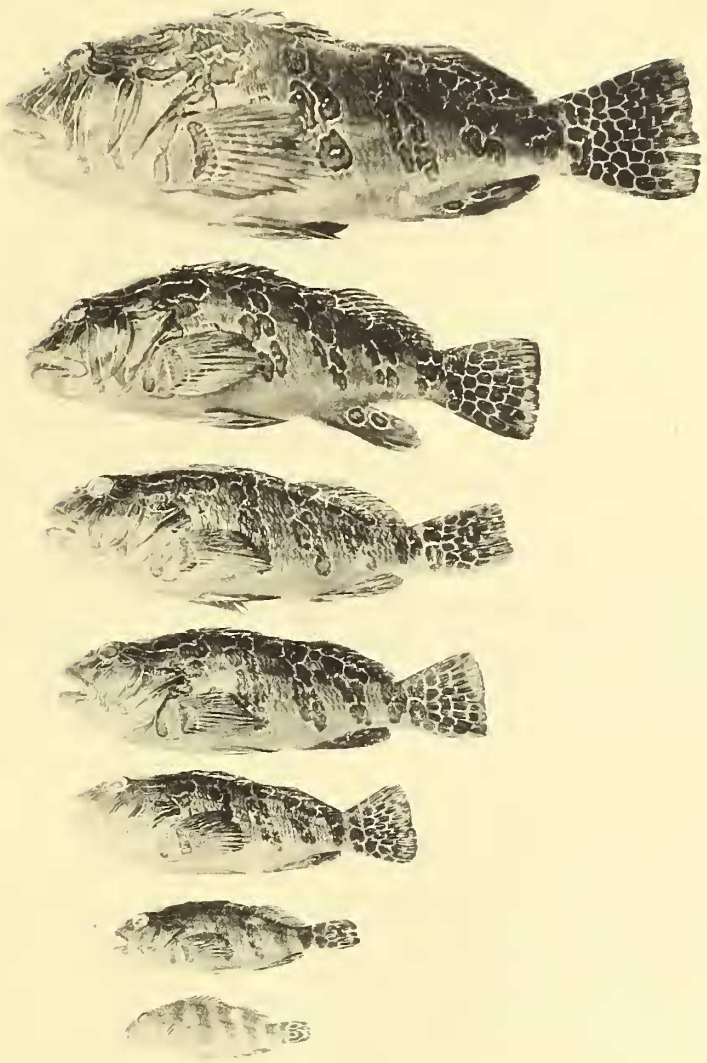
Note on *Cirrhitus rivulatus* (Valenciennes).

A 505 mm. fish of this species from the Galápagos Islands (U. S. Nat. Mus., 38,302) examined after this paper was in page proof, has the color bars and bands, especially those of the head, much wider than in smaller specimens and occupying relatively a greater amount of space when compared with the interspaces. The teeth of the upper jaw in this specimen show a few enlarged canines. In the lower jaw the enlarged canines of the middle of the side of each jaw (3 on the right side and 5 on the left) are very large and conspicuous and are wider apart than in smaller fish. Anterior to these there are two or three small canines and posterior to the enlarged group on each side are a group of smaller canines. The villiform teeth in the lower jaw occupy a small patch in the front of each jaw anterior to the large lateral teeth.

EXPLANATION OF THE PLATE.

Plate I.

Cirrhitus rivulatus (Valenciennes). Seven individuals from Corinto, Nicaragua, 65 mm. to 240 mm. standard length, showing the alteration in pattern correlated with growth and size.



A REVIEW OF THE AMERICAN FISHES OF THE FAMILY CIRRHITIDAE.